

CLAIMS

What is claimed is:

1. A method for transferring data in a PPRC environment, comprising:
 - pre-allocating at least a first payload buffer in a secondary storage control unit;
 - pre-allocating at least a first data buffer in the secondary storage control unit;
 - issuing a first write command for the transfer of a first block of data from a primary storage control unit to the secondary storage control unit;
 - packaging write control information with a fibre channel protocol (FCP) command within a first extended command descriptor block (CDB);
 - transmitting the first extended CDB from the primary storage control unit to the secondary storage control unit; and
 - transmitting the first block of data from the primary storage control unit to the secondary storage control unit.
2. The method of claim 1, further comprising disabling a "transfer ready" command prior to issuing the first write command.
3. The method of claim 1, further comprising:
 - receiving the first extended CDB in a first payload buffer;
 - receiving the first block of data in a first data buffer;
 - completing a first write operation; and
 - transmitting a first status indicator from the secondary storage control unit to the primary storage control unit acknowledging completion of the first write operation.
4. The method of claim 1, further comprising:
 - issuing a second write command for the transfer of a second block of data from the primary storage control unit to the secondary storage control unit;

packaging write control information with an FCP command within a second extended CDB;

transmitting the second extended CDB from the primary storage control unit to the secondary storage control unit; and

transmitting the second block of data from the primary storage control unit to the secondary storage control unit.

5. The method of claim 4, further comprising:

receiving the second extended CDB in a second payload buffer;

receiving the second block of data in a second data buffer;

completing a second write operation; and

transmitting a second status indicator from the secondary storage control unit to the primary storage control unit acknowledging completion of the second write operation.

6. The method of claim 5, wherein the second payload buffer and the second data buffer are pre-allocated.

7. The method of claim 5, wherein the second payload buffer and the second data buffer are allocated following receipt of the first extended CDB and the first block of data by the secondary storage control unit.

8. The method of claim 4, wherein the steps of transmitting the second extended CDB and transmitting the second block of data begin before the first status indicator is received by the primary storage control unit .

9. The method of claim 1, further comprising:

transferring the first block of data to a storage drive; and

releasing the first payload buffer and the first data buffer, whereby a subsequent extended CDB and block of data are receivable in the first payload buffer and first data buffer, respectively.

10. A peer-to-peer remote copy storage system, comprising:
 - a primary storage control unit;
 - a secondary storage control unit;
 - a first pre-allocated payload buffer in the secondary storage control unit;
 - a first pre-allocated data buffer in the secondary storage control unit;
 - means for issuing a first write command for the transfer of a first block of data from the primary storage control unit to the secondary storage control unit;
 - means for packaging write control information with a fibre channel protocol (FCP) command within a first extended command descriptor block (CDB);
 - means for transmitting the first extended CDB from the primary storage control unit to the secondary storage control unit; and
 - means for transmitting the first block of data from the primary storage control unit to the secondary storage control unit.
11. The system of claim 10, further comprising means for disabling a "transfer ready" command prior to issuing the first write command.
12. The system of claim 10, further comprising:
 - means for receiving the first extended CDB in the first payload buffer;
 - means for receiving the first block of data in the first data buffer;
 - means for completing a first write operation; and
 - means for transmitting a first status indicator from the secondary storage control unit to the primary storage control unit acknowledging completion of the first write operation.
13. The system of claim 10, wherein:
 - the means for issuing the first write command includes means for issuing a second write command for the transfer of a second block of data from the primary storage control unit to the secondary storage control unit;

the means for packaging write control information includes means for packaging write control information with an FCP command within a second extended CDB;

the means for transmitting the first extended CDB includes means for transmitting the second extended CDB from the primary storage control unit to the secondary storage control unit; and

the means for transmitting the first block of data includes means for transmitting the second block of data from the primary storage control unit to the secondary storage control unit.

14. The system of claim 13, further comprising:

a second payload buffer for receiving the second extended CDB; and
a second data buffer for receiving the second block of data.

15. The system of claim 14, wherein:

the means for completing the first write operation includes means for completing a second write operation; and

the means for transmitting a second status indicator includes means for transmitting a second status indicator from the secondary storage control unit to the primary storage control unit acknowledging completion of the second write operation.

16. The system of claim 15, wherein the second payload buffer and the second data buffer are pre-allocated.

17. The system of claim 15, wherein the second payload buffer and the second data buffer are allocated following receipt of the first extended CDB and the first block of data by the secondary storage control unit.

18. The system of claim 13, wherein transmitting the second extended CDB and transmitting the second block of data begin before the first status indicator is received by the primary storage control unit .

19. A peer-to-peer remote copy primary storage control unit, comprising:

means for directing that a first payload buffer be pre-allocated in a secondary storage control unit;

means for directing that a first data buffer be pre-allocated in the secondary storage control unit;

means for issuing a first write command for the transfer of a first block of data to the secondary storage control unit;

means for packaging write control information with a fibre channel protocol (FCP) command within a first extended command descriptor block (CDB);

means for transmitting the first extended CDB to the first payload buffer; and

means for transmitting the first block of data to the first data buffer.

20. The primary storage control unit of claim 19, further comprising means for disabling a "transfer ready" command prior to issuing the first write command.

21. The primary storage control unit of claim 19, further comprising:

means for receiving a first status indicator from the secondary storage control unit acknowledging completion of a first write operation.

22. The primary storage control unit of claim 19, wherein:

the means for issuing the first write command includes means for issuing a second write command for the transfer of a second block of data to the secondary storage control unit;

the means for packaging write control information includes means for packaging write control information with an FCP command within a second extended CDB;

the means for transmitting the first extended CDB includes means for transmitting the second extended CDB to the secondary storage control unit; and

the means for transmitting the first block of data includes means for transmitting the second block of data to the secondary storage control unit.

23. The primary storage control unit of claim 22, wherein:

the means for completing the first write operation includes means for completing a second write operation; and

the means for transmitting a second status indicator includes means for transmitting a second status indicator from the secondary storage control unit to the primary storage control unit acknowledging completion of the second write operation.

24. The primary storage control unit of claim 23, wherein the second payload buffer and the second data buffer are pre-allocated.

25. The primary storage control unit of claim 23, wherein the second payload buffer and the second data buffer are allocated following receipt of the first extended CDB and the first block of data by the secondary storage control unit.

26. The primary storage control unit of claim 22, wherein transmitting the second extended CDB and transmitting the second block of data begin before the first status indicator is received by the primary storage control unit .

27. A computer program product of a computer readable medium usable with a programmable computer, the computer program product having computer-readable code embodied therein for transferring data in a PPRC environment, the computer-readable code comprising instructions for:

pre-allocating at least a first payload buffer in a secondary storage control unit;

pre-allocating at least a first data buffer in the secondary storage control unit;

issuing a first write command for the transfer of a first block of data from a primary storage control unit to the secondary storage control unit;

packaging write control information with a fibre channel protocol (FCP) command within a first extended command descriptor block (CDB);

transmitting the first extended CDB from the primary storage control unit to the secondary storage control unit; and

transmitting the first block of data from the primary storage control unit to the secondary storage control unit.

28. The computer program product of claim 27, further comprising instructions for disabling a "transfer ready" command prior to issuing the first write command.

29. The computer program product of claim 27, further comprising instructions for:

receiving the first extended CDB in a first payload buffer;

receiving the first block of data in a first data buffer;

completing a first write operation; and

transmitting a first status indicator from the secondary storage control unit to the primary storage control unit acknowledging completion of the first write operation.

30. The computer program product of claim 27, further comprising instructions for:

issuing a second write command for the transfer of a second block of data from the primary storage control unit to the secondary storage control unit;

packaging write control information with an FCP command within a second extended CDB;

transmitting the second extended CDB from the primary storage control unit to the secondary storage control unit; and

transmitting the second block of data from the primary storage control unit to the secondary storage control unit.

31. The computer program product of claim 30, further comprising instructions for:
 - receiving the second extended CDB in a second payload buffer;
 - receiving the second block of data in a second data buffer;
 - completing a second write operation; and
 - transmitting a second status indicator from the secondary storage control unit to the primary storage control unit acknowledging completion of the second write operation.
32. The computer program product of claim 31, wherein the second payload buffer and the second data buffer are pre-allocated.
33. The computer program product of claim 31, wherein the second payload buffer and the second data buffer are allocated following receipt of the first extended CDB and the first block of data by the secondary storage control unit.
34. The computer program product of claim 30, wherein transmitting the second extended CDB and transmitting the second block of data begin before the first status indicator is received by the primary storage control unit .
35. The computer program product of claim 27, further comprising instructions for:
 - transferring the first block of data to a storage drive; and
 - releasing the first payload buffer and the first data buffer, whereby a subsequent extended CDB and block of data are receivable in the first payload buffer and first data buffer, respectively.